

PARTICIPATION, PATERNALISM AND PRACTICALITY: RECONCILING SUSTAINABILITY SCIENCE AND INDIGENOUS AGENDAS(1)

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Abstract

Andean communities are notorious for making sure that outsiders address their local needs as a condition for carrying out scientific or applied projects. What an Andean community, however, sees as relevant may or may not be within the rubric of “participatory research” as it is practiced in much of the world. In fact, overzealous participatory researchers may be seen as just as bothersome as their predecessors bearing long questionnaires. More important to Andean people is an equitable, non-paternalistic relationship with researchers in which exchanges of value are made. A distinction between “extractive” and “enriching” research is drawn. A case study is described in Cotacachi, Ecuador, in which scientists carried out enriching research activities of interest to local people as a way to generate social capital for conducting basic research which does not have an obvious, immediate local benefit. The requested research did not have a conventional participatory methodology but provided valuable products (educational opportunity, germplasm, community visualization tools, and information) to the indigenous community in exchange for time and resources to conduct more basic, scientific research. I argue that in the Andean context the key to reconciling the needs of scientists and of local needs is seeking new forms of equitable collaboration which reach beyond the present and now somewhat tired discourse of “participation”.

Introduction

In 1777 the indigenous women of Cotacachi, Ecuador, started a rebellion against a planned Spanish household census ordered by Carlos III as part of the Bourbon reforms in the Spanish colonies. The purpose of the census was to collect information to shift the tax burden from communities to households and individuals. The rebellion spread throughout the northern Andean Ecuador during which the Indians burned haciendas, ransacked colonial offices, and killed Spaniards and mestizos. Fast forward to 2007 and modern Cotacachi. The indigenous organization, UNORCAC (Union of Campesino and Indigenous Organizations of Cotacachi) is now planning a complete household census of their communities with the help of scientists and NGOs. After debating the census over a number of years, the leaders have decided that they need their own census data as a counter to perceived inaccurate information on the demographics and household conditions of the indigenous people.

Given that much of the discussion around the pros and cons of participatory research has centered on “how-to” methods, the story of Cotacachi’s feelings about census surveys carries a message. The method—in this case, a census—is not the issue for Cotacachenos. Rather, it is about who controls the method and the uses to which the information is subsequently put. In 1777, the indigenous women feared that the census would increase their household tribute and lead to the branding and enslavement of their sons. In 2007, the indigenous people believe a household census under their control will correct statistical underreporting which affects allocation of state resources. Applying this lesson to our discussion about Farmer-First and participatory action research, we have to wonder if too much attention has been paid to creating and promoting “participatory methods” and not enough discussion about what local communities really want and need. Through a discussion of a sustainability science research project in Ecuador, I will discuss how local people and scientists have

attempted to jointly reconcile their very different needs. In presenting this case, I will examine new forms of participation and collaboration between outside scientists (and NGOs) with indigenous people as they seek mutually beneficial ends.

Participatory Research: Uses and Abuses

Like many development ideas, participatory research analysis (PRA) has followed a path of paradigm-challenging beginnings to religious bandwagon adoption followed by amateurism overuse and misuse and finally widespread criticism and even abandonment in some development circles. In PRA's early years, the cafeteria of different participatory methods was a welcomed change from the limited top-down approaches of the past. PRA was conceived by some as an emerging paradigm for development, not just new techniques for technology design and adoption (Chambers 1994b). By the mid-1990s, it was difficult to get a development project funded if one did not include some aspect of participatory research. Ultimately, The World Bank, FAO and most bilateral development agencies became fervent true believers, even more so than many social scientists who had pushed for participatory research in the first place (Kumar 1993). Many "how-to-do participatory research" manuals, protocols, and case studies were published in the development literature. What started as a humble and innovative people-first approach among a small group of grassroots proponents ultimately became a development "industry" in itself.

By 2000, critical voices against participatory research increased the possibility that the new development "baby would get thrown out with the bathwater" (Bentley 1994). Initially, PRA was a refreshing alternative to researcher-controlled methods but as it became a standard *modus operandi*, it took on many negative characteristics of the earlier "top down" approaches. Unconvinced scientists and development specialists claimed that PRA was often superficial, unsystematic, and costly. Disappointment with PRA also came from indigenous communities which grew increasingly weary of time-demanding participatory activities. Local people became bored or insulted by constant requests to engage in community meetings, mapping exercises, group treks, ranking and sorting tasks (Ehrhart 2004).

PRA can be a set of effective methods in the hands of seasoned fieldworkers but can be chaotic and sometimes useless under the direction of poorly trained personnel. In the rush to get on the PRA bandwagon, quality control and training were frequently overlooked, in part on the belief that anyone could do PRA. In the minds of some project administrators and biological scientists, PRA was seen as an inexpensive way to replace basic social science research (Rhoades 2004). Curiously, when PRA went bad there was a tendency to blame social scientists whether or not they were the ones promoting or leading PRA. NGO personnel without advanced degrees could run PRA exercises even if they had no solid training in social science research. PRA facilitated control by community-based NGOs who became "gatekeepers" through which scientists had to pass. Participatory research was a boom for NGOs who found themselves well funded to run workshops and training in participatory methods. Frequently, NGOs organize participatory events whether or not local people wanted them in the first place. Some critics even came to speak of the "tyranny of participation" in which all other approaches were suppressed.

Scientists working under the Agenda 21 mandate of sustainability science frequently expressed frustration that participatory methods were too socially oriented and location specific to help answer key biophysical or global sustainability research questions (Rhoades 1999). With surveys, sampling techniques, statistical tests, random block design experiments, and other methods of "conventional science" ruled old-fashion, it was difficult for scientists to extrapolate findings beyond the particular field scale and site. Sustainability research is far more complex and difficult than the previous transfer of technology model. The new paradigm of sustainability requires long-term research in interdisciplinary teams of biological and social scientists examining multiple scale environments (landscapes, watersheds, catchments and ecoregions) inhabited by diverse stakeholders with different values (Obasi 2002). As a result, many scientists are uncomfortable with the notion that their research address the needs of one group and location in a watershed. Although it is understandable that indigenous communities want development and science to address local priorities, sustainability scientists need the opportunity to conduct research on the interaction between environment and society which will have wider regional or global relevance. The question, then, becomes: is it possible for scientists to approach and achieve common ground with local communities so that the science can be accomplished. If it is possible, what trade-offs will occur in this process (Ashby 2003)?

The Indigenous Right Movement in the Andes and its impact on community-based development

Under the influence of the 1990s indigenous movement in Latin America, participation has taken on new meaning as indigenous peoples have assumed more control over their own development agendas (Rhoades 2006). In Bolivia and Peru, individuals of indigenous origins have been elected state President while in Ecuador the indigenous vote put one President into power and later removed another through protest. The indigenous platform has centered on greater civil rights, better education and health, and access to ancestral lands and sovereignty over their traditional knowledge and resources (Gray 1997; Warren and Jackson, 2002). As this movement has grown and local communities have taken increasing charge of local development projects, scientists and NGOs specialists have often found themselves rebuked, ignored and sometimes even physically rejected from communities (Nigh 2002).

What local communities demand is not necessarily a choice between participatory as opposed to formal research but a new, mature relation with outside agencies and individuals. Indigenous leaders speak of “equity without paternalism” and “development with identity.” In this regard, Waters-Bayer (1994) has drawn a useful distinction between “extractive research” versus “enriching research”. Extractive research aims to provide support and information to development agencies, non-academic community, or NGOs (non-governmental organizations), while enriching research operates within a collaborative framework wherein local people’s values and priorities are addressed and the research helps them deal with the outside world to achieve their own culturally defined goals. It is not automatic that formal, scientific-led research is extractive while participatory research is enriching. In some cases, participatory research can be seen by local communities as extractive, with villagers being encouraged or manipulated to carry out activities of primary interest to the donor or researcher.

Reconciling Local and Global Agendas in Cotacachi, Ecuador

Since 1997, I have led an interdisciplinary team of agricultural and natural resource scientists working with an indigenous organization— (UNORCAC)—and the Cotacachi cantonal government to provide research findings to help make informed decisions about the management of natural resources and agriculture in their area. Our project, Sustainable Agriculture and Natural Resource Management (SANREM-Andes), had a mandate to carry out research and promote reliable information and decision-support tools for sustainable development in mountain regions of the world. The study area is located in the Ecuadorian highland region just north of the equator in the eastern part of Cotacachi canton where approximately 18,000 indigenous people live in 40 communities (comunas) distributed around the “skirt” (falda) of Mama Cotacachi, a 4993 masl volcano.

While our research was place-based in Ecuador, as scientists we were funded to do research which illuminated scale issues beyond Cotacachi. As academics, we faced pressure from fellow scientists, donors and technical reviewers to meet high standards or rigorous methods and data gathering. Field activities, such as collecting soil and water samples, setting up rain simulators or climate monitoring stations, analyzing people’s ablation activities, administering long questionnaires or measuring farm sizes, were not locally beneficially in the minds of local people. While scientists see these activities important for providing information for decision making by the local communities and decision makers, the immediate relevancy is not so clear to local people.

Our Cotacachi hosts were not opposed to scientific research, but they were looking for “enriching” research (Waters- Bayer 1994). Our team was aware that if our research benefited only ourselves as scientists or our donors in Quito or Washington, D.C., our Cotacachi hosts were have little interest in giving time, resources, and their knowledge to something which returns little of value. At the same time, we had to do our jobs as scientists operating in a wider donor and professional arena than just the communities. These differing needs led us to ask: 1. what kind of research did Cotacachenos want, if any?; 2. how could we as scientists reconcile local needs with our global science questions of sustainable research?

The rules governing our conduct of sustainability research in Cotacachi was agreed upon in 1997 between myself and officials of the canton (Mayor’s office) and UNORCAC. Cotacachi is not a place where outsider researchers, development practitioners or tourists can do whatever they wish. Indigenous communities demand directly or through the agency of UNORCAC that research or

development take place on their terms and on topics they see of benefit to the community. Permission to do research, which not always a formal bureaucratic procedure, requires approval by a range of local authorities, including government, UNORCAC, comunas or individual landowners. Within the communities, one will be met with cold stares and even aggressive rejection unless the activities are explained and approved by at least one indigenous body such as the comuna President, directorate or the assembly of UNORCAC.

The dilemma arising from this local approval process is that scientists frequently have basic research priorities and data gathering requirements that were not understandable or obviously relevant to local people. We were interested in basic research using the conventional methodology of testing hypotheses related to scientific questions. Only in rare cases was there an automatic overlap of scientists' and local peoples' interests. Such differences in needs and understanding are commonplace but are rarely discussed in methodologies of sustainability science or development. A great deal of ink is spilled over how different disciplines should work together or how to conduct participatory research, but little is said about how scientific interest can be reconciled with community needs. In general, NGOs do not face the same challenge since they rarely conduct research and tend to work on applied problems of concern to local people. Science, however, with its global questions and principles to test, operates under a different set of commands.

An operational challenge arises as to how the interests of scientists and local people can be addressed so that both are reasonably satisfied. While it is clear why researchers wanted to work in Cotacachi, it is not so obvious why Cotacachenos wanted to have researchers in their presence since we did not provide large sums of development funds as bilateral applied projects did. For diverse reasons, however, Cotacachenos believed researchers possessed valuable resources for them, beyond money. There was genuine interest in having data and any information they could use for obtaining grants, justifying projects to the government, leveraging in negotiations with donors or political fodder to use against less friendly candidates in elections. Throughout our stay in Cotacachi, specific interests based on real problems were expressed by Cotacachenos on ways that we could help them achieve their goal of "development with identity".

The process of arriving at a common consensus of exchange of research for local benefits did not occur in a straightforward or systematic way. A great deal of negotiation and "give and take" on the part of researchers and local people took place on many levels: the leadership of UNORCAC; with individual communities and their leaders; with farmers; with schools and professors; and with water associations. Agreements were often reached through informal conversations or gatherings in which local people would express certain needs which we could fulfill. By addressing these special requests, SANREM was allowed to stay and continue to do research of interest only to scientists. In the process of this negotiation, friendships were formed, co-madres and co-padres declared and alliances sealed. Over time, trust and confidence between researchers and local people put a very human face on our project and its interactions. More important than whether or not we espoused "participation" was trust gained through face-to-face exposure in the communities. In this regard, our approach was more in the vein of traditional ethnography (which has been severely criticized by PRA advocates).

Examples of Research addressing requests of indigenous communities

By accepting the responsibility of directing some resources, time and energy to priority research topics identified by local people, a social credit was created for us to use in pursuit of other research questions not prioritized by local people. This sometimes meant in the course of daily interaction we would be informed of a local interest or request and it was up to us how to make it fit with research. Five examples of "enriching" research activities requested by the indigenous people of Cotacachi are listed below. The reader will note that while several of these cases contained participatory elements, others did not. For example, the analysis of the water systems was largely survey-oriented and researcher controlled. The creation of an Atlas database was likewise based on the collection of secondary data and geographic systems information. They illustrate that one can do research while still addressing local issues and needs and also buy good-will for more specialized research that could be considered "extractive" if considered alone.

1. Indigenous Children's Scholarship Fund and Biodiversity Research

The leadership of UNORCAC and many families with whom we collaborated always stressed the critical need for education of indigenous children. The illiteracy rate is very high and few indigenous people can fill roles of leadership in their own communities, organizations, or schools. Many key positions for managing UNORCAC are held by mestizos or educated indigenous personnel from Otavalo. We therefore agreed to provide funding to select indigenous children to attend primary, secondary, and even college if they were willing to conduct memory banking research with their elders on the topic of landraces. Each child was allocated around \$20 (sufficient for entering school each term) if they would interview their parents, grandparents or other elders using the memory banking method.

The purpose of the memory banking project was to document and preserve local knowledge associated with agricultural crops so that neither seeds nor knowledge would be lost (Nazarea, 1998). While old varieties are of keen interest to local people, it is unlikely they would give then own time and energy to recovering this knowledge on a wider scale than their own household. However, if memory and seed collection are connected with the possibility that a child in their family can attend school, then parents were enthusiastic to participate. Each year 15 indigenous children received funding for school activities if they documented vanishing agrobiodiversity knowledge. They asked a series of basic questions ('what varieties did your grandparents grow?' 'How did farming change over time?'). In addition to learning how to interview, record information and store it in the project database, they also collected culturally significant plants (leaves, seeds, and roots) and prepared them for display and herbarium storage. In addition, the scholarship students (*becarios*) planted and maintained a biodiversity garden on the grounds of Jambi Mascaric. Children also made public exhibitions of the plants and elders knowledge during special days at the school. Two goals were accomplished: scientists gained information about changing agrobiodiversity and children were able to attend school. The memory banking collaborative project illustrates how both scientists and local people gained in a collaborative effort of dovetailing interests.

2. Farmer-led *In situ* agrobiodiversity farm

An outgrowth of the memory banking project was the establishment of a participatory farm in the high zone of Cotacachi called the Ancestral Futures's Farm. Two main objectives of the ancestral farm were: 1. create an *in situ* farm whereby vanishing or culturally significant Andean crops could be grown out and re-distributed to local people; 2. collaborate with the national genetic resources bank (INIAP: Instituto Nacional Autónomo de Investigaciones Agropecuarias) by obtaining and growing out disappearing Andean crops with local participation. The local farm would be a mechanism to recuperate Andean crops that have been mostly or completely abandoned and an educational tool for dialogue between indigenous collaborators, scientists (SANREM, NGOs, and INIAP), and young people with elders, on the issue of loss of local landraces.

Cotacachi is losing its traditional agrobiodiversity due to multiple factors including climate change, the Green Revolution, declining family labor, and minifundization. The Ancestral Futures Farm activity was seen by UNORCAC as an important element in the larger indigenous cultural revitalization movement. In Andean cultures an inextricable link exists between biology/culture and the past and present. The focus of that ritual nurturance is on the field (*chacra*) and the *ayllu* (disappearing in Cotacachi but still known) or the family. Bringing back the old crops was symbolic of the recovery of their traditions.

The Ancestral Farm was established in Ushugpungo in October 2002, with the families of 13 memory banking students. The parents provided knowledge and labor in exchange for scholarships for their children. Since the children were mainly in school when the farm was worked, the parents organized weekly *minga* (planting, weeding, harvesting). The farm was divided into halves: one dedicated to local varieties and planted under the direction of the parents; the other half was planted in INIAP varieties using their specifications on spacing and planting depth. The local side was driven as much as possible by indigenous planting rules, their perceptions, and desires. In keeping with traditional practices, the farm was entirely organic and managed using local knowledge. The parents led this process by planting "ally" crops together and keeping the crops that "don't get along" apart, just as they had learned from their parents. The crop they had least knowledge of was *mashua*, but it was planted similarly as *oca* which it strongly resembles (Moates, 2003). The mothers provided the seed they planted in their part of the farm. They provided 2 types of quinoa, peas, chochos, habas,

mellocos, chaucha potato, mashuas and ocas, all from their own farms. At harvest time, we conducted structured interviews with the participants to see how they regarding the experience and the varieties. There was a kitchen follow-up on the food preparation, cooking, and consumption of the crops. The women provided detailed insights on the cooking quality, taste, and overall performance of different varieties.

The Ancestral Futures farm turned out to be positive for both scientists and local people. Local people received new varieties, exchanged them among themselves, took home some food and received support for their children to go to school. SANREM, in turn, received a great deal of information about local varieties: why some had disappeared; what still existed; and what was desired through repatriation. The Ancestral Futures Farm continued operation under local direction after our project officially closed in May, 2004.

3. The Participatory 3D “Maqueta” Model

UNORCAC is a second degree indigenous organization which depends almost entirely on external funds for its activities. UNORCAC's leadership needs natural resource information and decision support tools which can be used in negotiation with donors and bilateral projects. They also request information which helps them interact with member communities and to help establish planning priorities. One example of how SANREM contributed to UNORCAC's decision support was the construction of a three dimensional physical model of the Cotacachi Andean landscape. Called the P3DM (Participatory 3 Dimensional Modeling), or “maqueta” in Spanish, this tool has recently been made popular by IAPD (Integrated Approaches to Participatory Development) in the Philippines (see http://www.iapad.org/participatory_p3dm.htm). However, the use of the *maqueta* in the Andes goes back to Inca times when physical models were used to plan towns, agricultural fields, and irrigation systems (Hyslop, 1990). We built and used the model at a scale of 1: 10,000 as part of a participatory process whereby spatial information is combined with people's knowledge for advocacy, awareness raising, community planning, conflict resolution, and participatory monitoring and evaluation.

The relief model of the landscape is built by placing layers of cardboard on top of one another, each layer having been cut out to represent the contour lines of a topographical map. Because of an emphasis on the vertical dimension, this tool is particularly suited to application in mountain environments. Verticality is a fundamental feature of Andean landscapes and livelihoods, which rely on exchanges of goods and services among production zones and social spaces at different altitudinal levels. In Cotacachi, this layered system structures agricultural practices, migratory patterns, community relationships, and cognitive perspectives. In participatory mapping exercises, local people tend to draw their communities in terms of vertical arrangements. A relief model is therefore better able to represent key ecosystem linkages as well as to be more consistent with local understanding of the environment than two dimensional maps or images. Using the *maqueta* is inherently dynamic and never completed, since information is constantly revised and updated as new stakeholders or processes intervene and affect the landscape.

After the basic relief model was laid out, the specific features and properties of the landscape were filled in by local people through a participatory workshop. This exercise offered a unique educational opportunity that enabled local people to clearly visualize and understand issues of both human-environment interactions. Among stakeholders, it also provided a platform for dialogue concerning watershed management and mediation of conflicts surrounding natural resource use. For instance, it served as a visual aid to indigenous communities and their neighbors in the facilitation of agreements surrounding grazing rights and resource use in the Cotacachi-Cayapas Ecological Reserve. The model allowed concrete discussion of territorial boundaries, often the subject of tension because of contradictions between ancestral rights, formal deeds, and land reform provisions. In the effort to promote rural eco-tourism and generate revenues in the region, UNORCAC uses the *maqueta* to highlight locations of cultural and natural interest, such as sacred places (i.e., where ritual baths or cleansings are held) and hiking trails leading to Cuicocha Lake and to the summit of Mt. Cotacachi. The *maqueta* was also an important tool for researchers as it was useful for integration and analysis of natural resource data. In interaction with local people, we were able to pinpoint on the *maqueta* local geographical knowledge on the landscape and analyze it in the broader context of regional economy/ecology and natural and social system interactions.

The *maqueta*, therefore, was a product from SANREM research that was seen by the indigenous leadership of UNORCAC as an extremely valuable tool. It is a powerful instrument for information exchange and analytical reflection on landscape change, conflict resolution and watershed management. The *maqueta* is located today in the training conference room of UNORCAC and is used almost daily for training activities.

4. Diagnosis of Water Systems in Cotacachi

Water is the most critical natural resource in Cotacachi because of an essential role in human survival and its increasing scarcity as a clean and ample resource. The local water systems have multiple problems: poor service, inability to collect user fees, high costs, limited supply, sanitation, conflict over access and control of water between communities, individuals, and government agencies. They also lack essential information about the water systems. Local water associations (*juntas*) have organized over the past decades in response to new infrastructure and changes needs of users in the landscape. Given limited government support and subsidies for water so local communities are often left to their own resources and ingenuity.

Due to water's central role in the lives of Cotacacheños, we were regularly called upon to help with some aspects of the water systems: providing training on citizen water monitoring, generating data on quality and quantity of water, GIS mapping of water systems, or lending time of our research assistants to help water associations in collecting funds. The SANREM office, in fact, was also the water association office for two of the largest water association, Chamuvi and Cambugan. Interested in improving their service, the *juntas* of these two association requested that SANREM help gather specific data on quality, coverage, trends regarding numbers of users, and supply capacity.

The Geography School at the Catholic University-Quito agreed to conduct the study for the water associations (Mayorga, 2004). The Cambugan water system serves 6 communities (1177 users) and Chumavi serves 7 (1504 users). Typically, the administration of a local water system is done through water *juntas*: a central one and others in each one of the communities which are integrated by a president, a vice president, a secretary, a treasurer, and an operator. The funds come from the collection of water service fees paid by the communities, although there is little support. There is one operator per community in charge of repairs and installation of new pipelines. In carrying out the research, the geography team conducted office work and field work. They surveyed and digitized each of the water systems designed surveys for users (n=490) and administrators, and held workshops. The information from the points collected with GPS (Geographical Positioning System) equipment and the information tabulated in Excel was integrated with Arc View. They also developed maps of the pipelines. The Catholic University team submitted final reports in digital format and hard copy containing detailed infrastructure information to the two water system authorities, along with suggestions on how to improve the systems. The study, although requested by local water authorities, also provided excellent information for our own scientific work on water in Cotacachi.

5. Cotacachi Environmental Atlas

Ironically, the most desired product from our research was data. Indigenous leaders of UNORCAC as well as NGO personnel sought information on varied topics for securing funding or grants. Since little systematic information on Cotacachi existed, we were constantly called upon for data on water, soils, climate, agricultural production, or secondary government statistics which were also available to anyone but had not been gathered systematically. The information was put into the SANREM computers or placed in hard copy in two open access filing cabinets. We placed no restriction on these data and left all control in the hands of the UNORCAC's leadership. We only asked that all hard copy information be returned to the filing cabinets after their use.

In addition to these archives, a data node was established in Catholic University-Quito where all available secondary and primary data on Cotacachi at the cantonal level was processed. "The Digital Atlas of Cotacachi Canton," headed by the School of Geography has produced a rich integrated GIS database which brings together biophysical, socioeconomic, and demographic information for the characterization of different parishes in the canton. This digital atlas is geared toward professionals, technical personnel, planners, policy makers and institutions involved in natural resource and rural development. Cotacachi as a canton is in the process of formulating a Cantonal Territorial Ordinance (*Ordenanza Territorial*) and this atlas serves to identify priorities through geographic analysis of vital

statistics and biophysical data. The atlas contains an ordered collection of color maps which represent spatial distribution and temporal variation of biophysical aspects and socioeconomic indicators of the parishes. The final atlas was produced in two forms: hard copy atlas and a digital version. The digital atlas can be managed from various locations, including from Catholic University or from Cotacachi itself. The atlas has been incorporated in the Canton's initiative on 'transparency through democracy' and will be available at the municipal library for public access.

Conclusion

Without denying the value of participatory methods and paradigms, our Andean experience shows that local communities want a relationship with researchers which is "enriching", not extractive. "Enriching" does not necessarily mean participatory in a methodological sense. Projects labeled "participatory" led by NGOs or scientists can be just as extractive (e.g., addressing needs of outsiders) as conventional R and D. As indigenous individuals receive education outside their communities and are exposed to global activities, they are becoming increasingly more sophisticated and practical in their understanding of research. Cotacachi indigenous leaders are now writing proposals and running development projects. Researchers who understand and respect self-determination by local communities can negotiate their own scientific programs by seeking common ground. I have presented five case studies which illustrate how researchers in Cotacachi, Ecuador, responded to community requests. In each example, valuable information was also generated for researchers. Moreover, by taking care to work on locally-relevant activities a social credit was earned which allowed researchers to pursue more esoteric, basic science questions. It is our belief that working on locally-defined problems and doing globally-relevant science are not inherent contradictions. Scientists can address broader questions related to society-environment interactions and impact while at the same time making sure their efforts are acceptable to local communities.

NOTE

(1). A previous version of this paper was published as "Reconciling Local and Global Agendas in Sustainable Development: Participatory Research with Indigenous Communities". Robert Rhoades and Virginia Nazarea. 2006. *Journal of Mountain Science* (3):334-346

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